

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-37 are rejected, as best understood, under 35 U.S.C. 103(a) as being unpatentable over Baumgartner et al. (6,161,813), In view of Narahara (JP 05223034A).

Baumgartner et al. shows a valve comprising: an opening (the path below element 25) having a sealing surface of the opening (where element 25 touches the valve seat); a stop, or opposing stop surface (the upper surface of element 54), displaced a distance from the opening; and an electromagnetic control valve including: a valve actuator (139, 127, 25) having an opening position (up) and a closing position (down), the valve actuator including: an actuator sealing surface (25) that engages the sealing surface of the opening when the valve actuator is at the closing position, an actuator stop surface (the bottom surface of element 139) larger than the sealing surface that engages the stop, or opposing stop surface, when the valve actuator is at the closing position, and a valve rod (127) disposed between the actuator sealing surface and the actuator stop surface. It appears from figure 3 that the valve rod (127) has a length that is greater by an excess length than a distance between the passages opening sealing surface and the opposing stop surface of the control valve.

Baumgartner et al. however fails to specifically disclose that when the valve actuator is

at the closing position, the excess length of the valve rod and the cooperation of the one end of the valve rod with the sealing surface and the opposite end of the valve rod with the stop surface provides a sealing function at the sealing surface by the one end of the valve rod while the opposite end of the valve rod provides for stopping of the valve rod and an associated damping function when the excess length is taken up by an elastic deformation of the valve rod.

However, Narahara shows an injection valve that includes an actuator valve rod 5 located in a nozzle body 7, wherein the actuator valve rod including an actuator stop surface (502), and an actuator sealing surface (501); the valve body including a sealing surface of the passage opening (701) and an opposing stop surface (704), the distance between the actuator stop surface (502) and the opposing stop surface (704) is set longer than the distance between the actuator sealing surface (501) and the sealing surface of the opening (701) when the actuator valve rod is lifted. In other words, the distance between the actuator stop surface (502) and the actuator sealing surface (501) is longer by an excess length than the distance between the opposing stop surface (704) and the sealing surface of the passage opening (701) (see figures 1 and 2). The valve operates in the following manner: When fluid is stopped, the actuator sealing surface (501) is brought into contact with the sealing surface of the passage opening (701) and the actuator stop surface (502) is brought into contact with the opposing stop surface (704) respectively by the elastic deformation of the actuator valve rod (5) (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to make the valve rod (127) of Baumgartner et al.'s valve, elastically deformable and slightly longer than the required length, just as the valve rod of the valve of Narahara is, so that when the valve is closed, the excess length of the valve rod is taken up by elastic deformation of the valve rod. This modification would allow for the shock of the valve closing to be absorbed at two positions rather than just one, as taught by Narahara (abstract).

Regarding claims 2 and 22, the stop surface of the actuator is significantly larger than the sealing surface (see Fig. 3).

Regarding claims 3, 4, 23 and 24 the valve actuator is a one-part valve rod and it contains a valve body which touches the front face of the valve rod and contains the sealing surface of the actuator (25).

Regarding claims 5 and 25, the valve body is constructed as a sphere, which interacts with the opening for the passage of fluid, forming a seal (See Fig. 3).

Regarding claims 6 and 26, the sealing surface of the actuator (25) is the front face of the valve rod.

Regarding claims 7, 9, the valve actuator (139) is mushroom-shaped, the stem of the mushroom forming the valve rod and the stop surface of the actuator being an annular collar, concentrically surrounding the valve rod in the region of the mushroom cap (24) (see Fig. 3).

Regarding claim 8, the valve actuator is divided by a dividing joint into an actuator stop (near 24), having the stop surface of the actuator, and a valve rod, in operative connection with the sealing surface and the stop of the actuator.

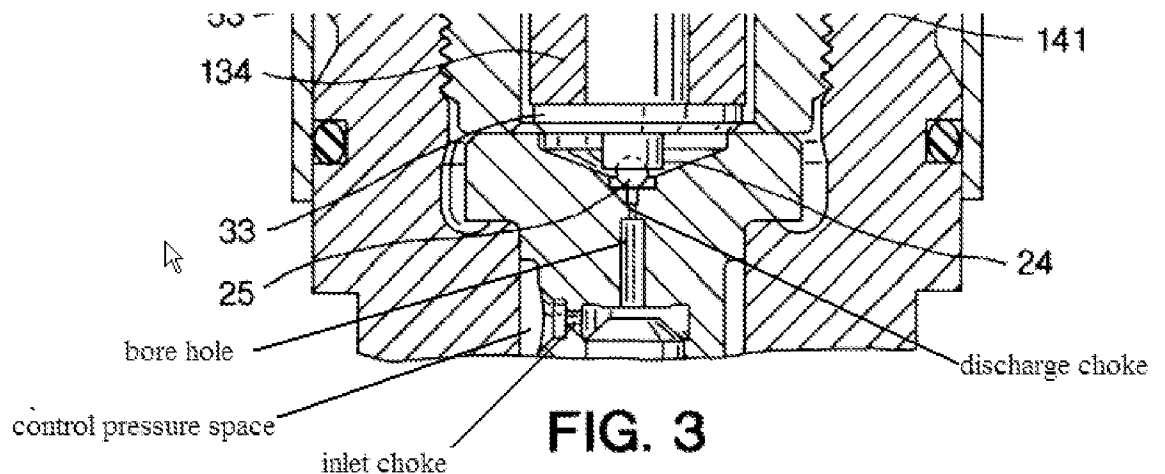
Regarding claims 10, 11, 27 and 28, the valve rod is guided axially movably in at least one guide bushing (134) and is disposed at a small distance from the sealing surface of the actuator (see Fig. 3).

Regarding claims 13 and 30 the sealing surface is formed in the end face of a disk-shaped insert part (the valve seat) (see Fig. 3) and adjoins the control pressure space on the side averted from the sealing surface.

Regarding claims 12 and 29, it is noted that the valve of Baumgartner et al. as modified by Kilgore et al. does not specifically disclose that the length of the valve rod is an integer multiple of its diameter.

However, it would have been obvious to one with ordinary skill in the art at the time the invention was made to make the length of the valve rod is an integer multiple of its diameter since our reviewing courts have held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Regarding claims 14-19, and 31-37 the insert part (also forms a stop for the valve needle) is formed in two parts with a first part, which contains an opening for the passage fluid and a discharge or outlet choke (see examiners marked up figure 3) and a second part at the control pressure space side, with a bore hole (see examiners marked up figure 3) which connects the control pressure space (see examiners marked up figure 3) with an opening for the passage of fluid. The second part contains an inlet choke (see examiners marked up figure 3) near the bore hole (see examiners marked up figure 3). The pressure space is connected with an inlet choke and the rear end of the valve needle (see examiners marked up figure 3) averted from the nozzle needle seat surface lies in the control pressure space. The pressure insert part also including an inlet choke and an outlet or discharge choke (see figure below).



Examiner's Marked Up Figure #3

Response to Arguments

Applicant's arguments filed 2/3/2010 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR*

International Co. v. Teleflex, Inc., 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, the motivation for combining the two references comes from the Narahara reference specifically. See the rejection above. Additionally it is noted that even though the armature plate 28 of Baumgartner is movably supported and is under spring resistance, in order to help absorb the shock, doesn't mean that having a longer valve rod that deforms to help prevent shock will not be necessary or would destroy the function of the valve of Baumgartner. It is the examiners opinion that adding an elongated valve rod that will deform to disperse the shock over to areas rather than just one would help the device of Baumgartner better absorb the shock after the armature plate 28 abuts member 54 and the valve rod still has some downward momentum. Therefore, it would still be beneficial to extend the valve rod and have it deform, in order to allow for the shock of the valve closing to be absorbed at two positions rather than just one, as taught by Narahara (abstract).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON J. BOECKMANN whose telephone number is (571)272-2708. The examiner can normally be reached on 8:00- 5:00, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571) 272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. J. B./
Examiner, Art Unit 3752
4/6/2010

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/Len Tran/

Supervisory Patent Examiner, Art Unit 3752